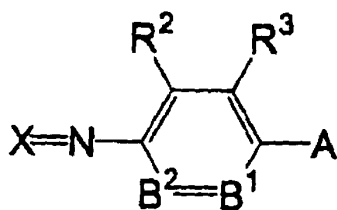


WHAT IS CLAIMED IS:

Sub. A1 ✓
1. An ink-jet ink comprising a coloring composition containing a coloring particulate containing an ionic-group-containing polymer, an oil-soluble dye, and a hydrophobic high-boiling-point organic solvent having a boiling point of at least 150°C, the coloring particulate being dispersed in a water-based medium, wherein content of the hydrophobic high-boiling-point organic solvent in the coloring composition is at least 25% by mass and not more than 95% by mass with respect to a total amount of the ionic-group-containing polymer, the oil-soluble dye, and the hydrophobic high-boiling-point organic solvent.

2. An ink-jet ink according to claim 1 wherein the oil-soluble dye is represented by following general formula I:

general formula I



wherein X represents a residual group of a color coupler; A represents one of $-NR^4R^5$ and a hydroxy group; R⁴ and R⁵ each independently represents one of a hydrogen atom, aliphatic group, aromatic group and heterocyclic group; B¹ represents one

group, aromatic group and heterocyclic group; B^1 represents one of $=C(R^6)-$ and $=N-$; B^2 represents one of $-C(R^7)=$ and $-N=$; R^2 , R^3 , R^6 and R^7 each independently represent one of a hydrogen atom, halogen atom, aliphatic group, aromatic group, heterocyclic group, cyano group, $-OR^{51}$, $-SR^{52}$, $-CO_2R^{53}$, $-OCOR^{54}$, $-NR^{55}R^{56}$, $-CONR^{57}R^{58}$, $-SO_2R^{59}$, $-SO_2NR^{60}R^{61}$, $-NR^{62}CONR^{63}R^{64}$, $-NR^{65}CO_2R^{66}$, $-COR^{67}$, $-NR^{68}COR^{69}$, and $-NR^{70}SO_2R^{71}$; R^{51} , R^{52} , R^{53} , R^{54} , R^{55} , R^{56} , R^{57} , R^{58} , R^{59} , R^{60} , R^{61} , R^{62} , R^{63} , R^{64} , R^{65} , R^{66} , R^{67} , R^{68} , R^{69} , R^{70} and R^{71} each independently represents one of a hydrogen atom, aliphatic group and aromatic group; and any of pairs, R^2 and R^3 , R^3 and R^4 , R^4 and R^5 , R^5 and R^6 , and R^6 and R^7 may bond together to form a ring structure.

3. An ink-jet ink according to claim 1, wherein the ionic-group-containing polymer is a vinyl polymer.

4. An ink-jet ink according to claim 1, wherein a relative dielectric constant at 25°C of the hydrophobic high-boiling-point organic solvent is from 3 to 12.

5. An ink-jet ink according to claim 1, wherein the vinyl polymer has at least one of carboxyl groups and sulfonic acid groups as ionic groups.

6. An ink-jet ink according to claim 1, wherein the

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cont.

hydrophobic high-boiling-point organic solvent is at least one
hydrophobic high-boiling-point organic solvent selected from
hydrophobic high-boiling-point organic solvents represented by
following formulae S-1 to S-9:

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$$\begin{array}{c} \diagup \\ \text{O}=\text{P} \begin{array}{l} \diagup (\text{O})_a-\text{R}_1 \\ \text{---} (\text{O})_b-\text{R}_2 \\ \diagdown (\text{O})_c-\text{R}_3 \end{array} \end{array}$$
*c1cc(ccc1C(=O)OR4)C(=O)OR5
$$(\text{Ar}-\text{COO})_6-\text{R}_7$$
$$(R_8-\text{COO})_f-R_9$$
$$R_{10}-(COO-R_{11})_g$$
$$R_{12}-X-N \begin{matrix} \nearrow R_{13} \\ \searrow R_{14} \end{matrix}$$
Oc1ccc(R15)cc1R16*N(R17)(R18)c1ccccc1R19
$$\text{R}_{20}-\text{S}-\text{R}_{21}$$

||
(O)₁

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in the formula S-2, R_4 and R_5 each independently represents one of an aliphatic group and an aryl group, R_6 represents one of a fluorine atom, chlorine atom, bromine atom, iodine atom, alkyl group, alkoxy group, aryloxy group, alkoxycarbonyl group and aryloxycarbonyl group, d represents an integer from 0 to 3, and, in a case where d is more than 1, one R_6 may be different from another R_6 ;

in the formula S-3, Ar represents an aryl group, e represents an integer from 1 to 6, and R₇ represents one of an e-valent hydrocarbon group and a hydrocarbon group that is mutually bonded by an ether bond;

in the formula S-4, R₈ represents an aliphatic group, f represents an integer from 1 to 6, and R₉ represents one of an f-valent hydrocarbon group and a hydrocarbon group that is mutually bonded by an ether bond;

in the formula S-5, g represents an integer from 2 to 6, R₁₀ represents a g-valent hydrocarbon group other than an aryl group, and R₁₁ represents one of an aliphatic group and an aryl group;

in the formula S-6, R_{12} , R_{13} and R_{14} each independently represents one of a hydrogen atom, aliphatic group and aryl group, X represents one of $-CO-$ and $-SO_2-$, and one of a pair R_{12} and R_{13} and a pair R_{13} and R_{14} may bond together mutually to

form a ring;

in the formula S-7, R_{15} represents one of an aliphatic group, alkoxycarbonyl group, aryloxycarbonyl group, alkylsulfonyl group, arylsulfonyl group, aryl group and cyano group, R_{16} represents one of a fluorine atom, chlorine atom, bromine atom, iodine atom, aliphatic group, aryl group, alkoxy group and aryloxy group, h represents an integer from 0 to 3, and in a case where h is more than 1, one R_{16} may be different from another R_{16} ;

in the formula S-8, R_{17} and R_{18} each independently represents one of an aliphatic group and an aryl group, R_{19} represents one of a fluorine atom, chlorine atom, bromine atom, iodine atom, aliphatic group, aryl group, alkoxy group and aryloxy group, i represents an integer from 0 to 4, and, in a case where i is more than 1, one R_{19} may be different from another R_{19} ;

in the formula S-9, R_{20} and R_{21} each independently represents an aliphatic group or aryl group, and j represents 1 or 2.

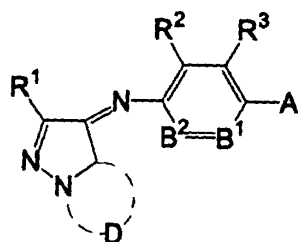
7. An ink-jet ink according to claim 1, wherein the content of the ionic-group-containing polymer is 1 to 70% by mass with respect to the total amount of the ionic-group-containing polymer, the oil-soluble dye, and the hydrophobic high-boiling-point organic solvent.

8. An ink-jet ink according to claim 1, wherein the content of the oil-soluble dye is 3 to 70% by mass with respect to the total amount of the ionic-group-containing polymer, the oil-soluble dye, and the hydrophobic high-boiling-point organic solvent.

9. An ink-jet ink according to claim 1, wherein average particle size of the coloring particulate is at most 100 nm.

10. An ink-jet ink according to claim 2, wherein the oil-soluble dye which is represented in said general formula I is a compound which is represented in the following general formula II:

General Formula II



wherein, R², R³, A, B¹, and B² are synonymous with R², R³, A, B¹, and B² in said general formula I;

R¹ represents one of a hydrogen atom, an aliphatic group, an aromatic group, a heterocyclic group, a cyano group, -OR¹¹, -SR¹², -CO₂R¹³, -OCOR¹⁴, -NR¹⁵R¹⁶, -CONR¹⁷R¹⁸, -SO₂R¹⁹, -

SO₂NR²⁰R²¹, -NR²²CONR²³R²⁴, -NR²⁵CO₂R²⁶, -COR²⁷, -NR²⁸COR²⁹,
and -NR³⁰SO₂R³¹;

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R¹¹, R¹², R¹³, R¹⁴, R¹⁵, R¹⁶, R¹⁷, R¹⁸, R¹⁹, R²⁰, R²¹, R²², R²³, R²⁴, R²⁵,
R²⁶, R²⁷, R²⁸, R²⁹, R³⁰, and R³¹ represent respectively
independently one of a hydrogen atom, an aliphatic group, and
an aromatic group;

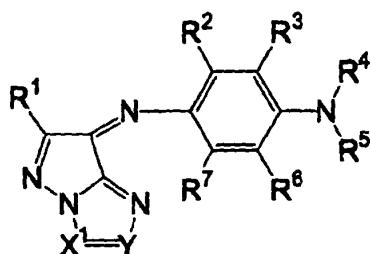
D represents an atom group which forms one of a five-
membered nitrogen-containing heterocyclic ring and a six-
membered nitrogen-containing heterocyclic ring which may be
substituted for at least one of an aliphatic group, an aromatic
group, a heterocyclic group, a cyano group, -OR⁸¹, -SR⁸², -CO₂R⁸³,
-OCOR⁸⁴, -NR⁸⁵R⁸⁶, -CONR⁸⁷R⁸⁸, -SO₂R⁸⁹, -SO₂NR⁹⁰R⁹¹, -
NR⁹²CONR⁹³R⁹⁴, -NR⁹⁵CO₂R⁹⁶, -COR⁹⁷, -NR⁹⁸COR⁹⁹, and -
NR¹⁰⁰SO₂R¹⁰¹;

the heterocyclic ring may further form a condensed ring
with another ring; and

R⁸¹, R⁸², R⁸³, R⁸⁴, R⁸⁵, R⁸⁶, R⁸⁷, R⁸⁸, R⁸⁹, R⁹⁰, R⁹¹, R⁹², R⁹³, R⁹⁴, R⁹⁵,
R⁹⁶, R⁹⁷, R⁹⁸, R⁹⁹, R¹⁰⁰, and R¹⁰¹ represent respectively
independently one of a hydrogen atom, an aliphatic group, and
an aromatic group.

11. An ink-jet ink according to claim 10, wherein the
compound which is represented in said general formula II is a
compound which is represented in the following general
formula III:

General formula III



wherein, R^1 , R^2 , R^3 , R^4 , R^5 , R^6 , and R^7 are synonymous with R^1 , R^2 , R^3 , R^4 , R^5 , R^6 , and R^7 in said general formula II;

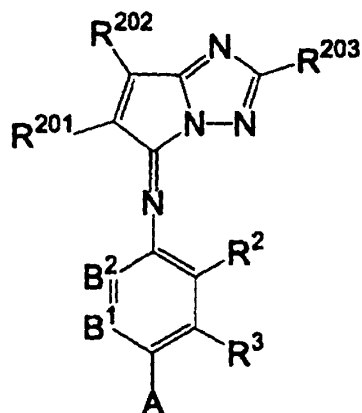
X^1 and Y represent respectively independently one of $-C(R^8)=$ and $-N=$;

R^8 represents one of a hydrogen atom, an aliphatic group, and an aromatic group; and

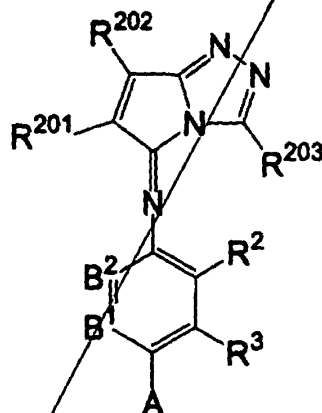
one of X^1 and Y is always $-N=$, and X^1 and Y are $-N=$ at different times.

12. An ink-jet ink according to claim 2, wherein the oil-soluble dye which is represented in said general formula I is at least one of compounds which are represented in the following formulas IV-1 to IV-4:

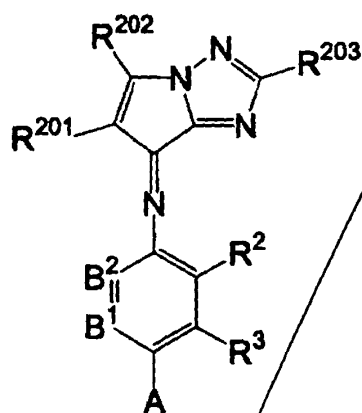
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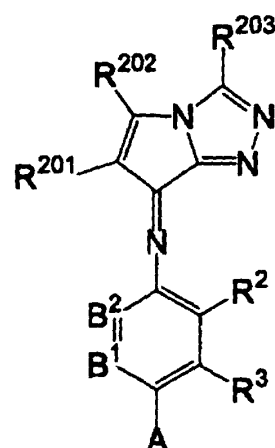
(IV-1)



(IV-2)



(IV-3)



(IV-4)

wherein, A, R², R³, B¹, and B² are synonymous with A, R², R³, B¹, and B² in said general formula I;

R²⁰¹, R²⁰², and R²⁰³ represent respectively independently one of a hydrogen atom, an aliphatic group, an aromatic group, a heterocyclic group, a cyano group, -OR¹¹, -SR¹², -CO₂R¹³, -OCOR¹⁴, -NR¹⁵R¹⁶, -CONR¹⁷R¹⁸, -SO₂R¹⁹, -SO₂NR²⁰R²¹, -NR²²CONR²³R²⁴, -NR²⁵CO₂R²⁶, -COR²⁷, -NR²⁸COR²⁹, and -

NR³⁰SO₂R³¹;

R¹¹, R¹², R¹³, R¹⁴, R¹⁵, R¹⁶, R¹⁷, R¹⁸, R¹⁹, R²⁰, R²¹, R²², R²³, R²⁴, R²⁵, R²⁶, R²⁷, R²⁸, R²⁹, R³⁰, and R³¹ represent respectively independently one of a hydrogen atom, an aliphatic group, and an aromatic group; and

R²⁰¹ and R²⁰² may be combined with each other and form a ring structure.

13. A coloring composition comprising a coloring particulate containing an ionic-group-containing polymer, an oil-soluble dye, and a hydrophobic high-boiling-point organic solvent having a boiling point of at least 150°C, the coloring particulate being dispersed in a water-based medium, wherein content of the hydrophobic high-boiling-point organic solvent in the coloring composition is at least 25% by mass and not more than 95% by mass with respect to a total amount of the ionic-group-containing polymer, the oil-soluble dye, and the hydrophobic high-boiling-point organic solvent.

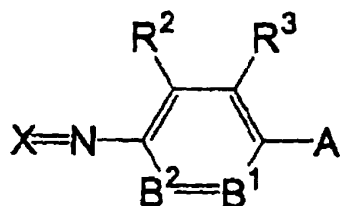
14. An ink-jet recording method in which recording is conducted using an ink-jet ink on a recording material, the ink comprising a coloring composition containing a coloring particulate containing an ionic-group-containing polymer, an oil-soluble dye, and a hydrophobic high-boiling-point organic solvent having a boiling point of at least 150°C, the coloring

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particulate being dispersed in a water-based medium, wherein content of the hydrophobic high-boiling-point organic solvent in the coloring composition is at least 25% by mass and not more than 95% by mass with respect to a total amount of the ionic-group-containing polymer, the oil-soluble dye, and the hydrophobic high-boiling-point organic solvent.

15. An ink-jet recording method according to claim 14 wherein the oil-soluble dye is represented by following general formula I:

general formula I



wherein X represents a residual group of a color coupler; A represents one of $-NR^4R^5$ and a hydroxy group; R^4 and R^5 each independently represents one of a hydrogen atom, aliphatic group, aromatic group and heterocyclic group; B^1 represents one of $=C(R^6)-$ and $=N-$; B^2 represents one of $-C(R^7)=$ and $-N=$; R^2 , R^3 , R^6 and R^7 each independently represent one of a hydrogen atom, halogen atom, aliphatic group, aromatic group, heterocyclic group, cyano group, $-OR^{51}$, $-SR^{52}$, $-CO_2R^{53}$, $-OCOR^{54}$, $-NR^{55}R^{56}$,

-CONR⁵⁷R⁵⁸, -SO₂R⁵⁹, -SO₂NR⁶⁰R⁶¹, -NR⁶²CONR⁶³R⁶⁴, -NR⁶⁵CO₂R⁶⁶, -COR⁶⁷, -NR⁶⁸COR⁶⁹, and -NR⁷⁰SO₂R⁷¹; R⁵¹, R⁵², R⁵³, R⁵⁴, R⁵⁵, R⁵⁶, R⁵⁷, R⁵⁸, R⁵⁹, R⁶⁰, R⁶¹, R⁶², R⁶³, R⁶⁴, R⁶⁵, R⁶⁶, R⁶⁷, R⁶⁸, R⁶⁹, R⁷⁰ and R⁷¹ each independently represents one of a hydrogen atom, aliphatic group and aromatic group; and any of pairs, R² and R³, R³ and R⁴, R⁴ and R⁵, R⁵ and R⁶, and R⁶ and R⁷ may bond together to form a ring structure.

16. An ink-jet recording method according to claim 14 wherein the recording material includes a substrate on which is provided an ink receiving layer containing a porous inorganic pigment.

17. An ink-jet recording method comprising the step of:

(a) preparing an ink-jet ink, containing coloring composition in which coloring particulate containing an ionic-group-containing polymer, an oil-soluble dye, and a hydrophobic high-boiling-point organic solvent having a boiling point of at least 150°C are dispersed in an aqueous medium, with the content of the hydrophobic high-boiling-point organic solvent in the coloring composition being at least 25% by mass and not more than 95% by mass with respect to total amount of the ionic-group-containing polymer, the oil-soluble dye, and the hydrophobic high-boiling-point organic solvent,

(b) disposing the ink-jet ink in a cartridge adapted for use

in an ink-jet printer, and

(c) using the cartridge in an ink jet printer for recording images.

18. An ink-jet recording method according to claim 17, wherein the step of preparing an ink-jet ink includes the sub-step of dispersing the ionic-group-containing polymer, the oil-soluble dye, and the hydrophobic high-boiling-point organic solvent by a co-emulsifying dispersion technique.

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